

REMARKS

This Amendment is in Response to the Office Action dated April 19, 2006, in which claims 1-38 were initially rejected. Applicants respectfully request reconsideration and allowance of all pending claims in view of the above-amendments and the following remarks.

I. INFORMATION DISCLOSURE STATEMENT

The Office Action indicates that reference AQ, entitled "Recognizing Call-Center Speech Using Models Trained from other Domains," which was submitted by Applicant with PTO-Form 1449 on February 12, 2004 cannot be found. Accordingly, enclosed is a further copy of the reference for the Examiner's consideration.

II. CLAIM REJECTIONS UNDER §112

Claims 11, 13, 23, 25, 32, 34 and 37 were rejected under §112, second paragraph as allegedly omitting central elements including the person(s) who is doing a manual review of inspection. While Applicants disagree, these claims have been amended to avoid the terminology objected to by the Examiner.

III. CLAIM REJECTIONS UNDER §102(b)

Claims 1-3, 6-9, 14-15, 18-20, 26-27, 29, 30, 35 and 36 were rejected under §102(b) as being anticipated by Almeida EP 0942575.

Independent claim 1 is amended to include the elements of dependent claim 7, which has been canceled. Similar amendments are made to independent claims 14, 26 and 35.

A. **Independent Claim 1**

Independent claim 1 is directed to a method of identifying a caller, which includes receiving a voice input from the caller and applying characteristics of the voice input to a plurality of acoustic models, which comprises a generic acoustic model and acoustic models of any previously identified callers, to obtain a plurality of acoustic scores. The generic acoustic model comprises caller independent models of a plurality of speech units.

The caller is identified as one of the previously identified callers of a new caller based on the plurality of acoustic scores.

If the caller is identified as a new caller, the method generates a new acoustic model for the new caller from the caller-independent models of the generic acoustic model. The caller independent models of the speech units that are included in the voice input are modified to represent the characteristics of the voice input received from the new caller.

Claim 1 is further amended to recite that the new acoustic model for the new caller and the acoustic model of any previously identified callers comprise the same plurality of speech units.

In one embodiment, the acoustic models have the same speech units since they are generated from caller-independent models of a generic acoustic model. In some embodiments, the speech units in each acoustic model include commonly used acoustic units such as senones, phonemes, diphones, syllables or words. Each speech unit call also include a combination of a set of sub-units.

In one embodiment, the method in claim 1 is capable of identifying a caller even if the caller does not cooperate with any prompt-response mechanisms used to route incoming calls. The acoustic characteristics of any utterance, whether that utterance is a proper answer to a prompt or not, is modeled for that caller, even if the caller is not a member of any predetermined list of callers.

**B. Almeida does not disclose a method in which new acoustic models of any previously identified callers comprise the same plurality of speech units**

Almeida discloses a very limited system, which requires extensive user input to create a predetermined list of expected caller names and requires the caller to respond accurately to prompts for a spoken name.

Paragraph [0033] describes that a voice recorder records the spoken name. There is a programmable list of names stored with a programmable set of instructions, a set of speaker dependent patterns and a set of speaker independent patterns. A speaker dependent recognizer processes the spoken name to produce a set of caller dependent patterns, wherein the set of caller dependent patterns are compared with the set of speaker dependent patterns for identification. If no identification is possible, a speaker independent recognizer processes the spoken name to

produce a set of caller independent patterns, wherein the set of caller independent patterns are compared with the set of speaker independent patterns for identification.

As described with reference to FIG. 4 in paragraphs [0093] and [0094], if the speaker dependent recognizer identifies a caller's name, speech samples for the caller name are collected for the creation of speaker dependent caller name patterns by a name-adaptive trainer. If the speaker dependent recognizer does not identify the caller's name, then the speaker independent caller name recognition is preformed. If the speaker independent recognizer recognizes the caller's name, speech samples for the caller name are collected for the creation of speaker dependent caller name patterns by the name-adaptive trainer.

As further described in paragraph [0100], if the caller is not in the predetermined caller list, the system requires the user to determine if the call should be added to the caller list. If so, the system disclosed by Almeida requires the user to follow the process shown in FIG. 3 in order to add the caller to the list and to add a speech sample corresponding to the caller's name in the list.

Paragraph [0089] describes the user set-up features shown in FIG. 3. As part of the system programming, the user enters the caller's name in the list of callers whom he/she wishes to identify. The user then speaks the caller's first and last names into a microphone a minimum of two times for adequate sampling. The speech signal samples of the spoken names are recorded by the system, and speaker independent spoken name patterns are created for these samples.

Thus, the speaker dependent caller name patterns correspond to the name of the particular caller and are unique to that caller. Almeida does not disclose a system or method in which new acoustic models of any previously identified callers comprise the same plurality of speech units.

In addition, the system would appear to fail to recognize the caller if the caller speaks a name differently, such as "Dave" and "David", in subsequent calls. Also, it appears that

the system would fail to recognize a caller who utters something other than the caller's name or is otherwise unresponsive to the system prompts.

Since Almeida does not disclose that each acoustic model for the new caller and the acoustic models of any previously identified callers comprise the same plurality of speech units within the context of the other elements of claim 1, Applicant respectfully requests that the rejection of claim 1 and its respective dependent claims under §102(b) based on Almeida be withdrawn.

In addition, numerous dependent claims include limitations that are not disclosed by Almeida in the context of independent claim 1.

**C. Independent Claims 14, 26 and 35**

Independent claims 14, 26 and 35 are amended in a similar fashion as independent claim 1 and are therefore also not anticipated by Almeida. Again, many of their dependent claims include elements that are also not disclosed by Almeida.

Applicant therefore respectfully requests that the rejection of these claims and their respective dependent claims under §102(b) based on Almeida be withdrawn.

**IV. CLAIM REJECTIONS UNDER §103(a)**

**A. Claims 4, 5, 16, 17 and 28**

Claims 4, 5, 16, 17 and 28 were rejected under §103(a) as being unpatentable over Almeida in view of Raman, U.S. Patent 5,893,059.

Regarding claims 4, 16 and 28, the Office Action suggests Almeida fails to explicitly teach updating the speech patterns, but suggests Raman teaches using newly obtained models for updating old models, citing column 6, lines 5-14.

Raman is directed to a method and apparatus for facilitating the transition from one speech recognition application or system to another without requiring the generation of new sets of speech recognition templates. (Column 3, lines 42-46).

However, neither Almeida nor Raman teach or suggest either separately or in combination a method of identifying a caller that implements the steps recited in claims 4-5, 16-17 and 28 within the context of their respective independent claims, particularly in the context

that a new acoustic model for a new caller and the acoustic models of any previously identified callers comprise the same plurality of speech units.

Accordingly, Applicant respectfully requests that the rejection under §103(a) based on Almeida and Raman be withdrawn.

**B. Claims 10, 22 and 31**

Claims 10, 22 and 31 were rejected under §103(a) as being unpatentable over Almeida in view of Maes U.S. Patent No. 6,088,669.

The Office Action acknowledges that Almeida fails to teach maintaining a caller specific language model for each of the previous identified callers, but suggests Maes discloses a method for identifying a speaker using speaker dependent and speaker independent models (column 5, line 61 to column 6, line 13) and special language models specific to previously identified speakers for speech recognition (column 4, lines 42-49).

Maes discloses a system in which speaker recognition is attempted on input speech signals. If a speaker is recognized, a speaker dependent model which has been trained on and enrolled speaker is supplied to the speech recognition system. If the speaker is not recognized, then a speaker-independent recognition model is used or, alternatively, the new speaker is enrolled. Thus, new speakers must be enrolled through the process described in column 4, lines 39-41, FIG. 2 and step 420 of FIG. 1.

The proposed combination of Maes and Almeida would still fail to teach or suggest the inventions recited in claims 10, 22 and 31 since neither reference teaches or suggests a method or system for identifying a caller recited in the independent claims in which a new acoustic model for a new caller and the acoustic models of any previously identified callers comprise the same plurality of speech units, within the context of the remaining elements of the claim.

**C. Claims 11, 23, 32 and 37**

Claims 11, 23, 32 and 37 were rejected under §103(a) as being unpatentable over Almeida in view of Chen.

The Office Action alleges that Almeida fails to teach manually inspecting discrepancies in the speech recognition, but suggests that Chen teaches that in marginal recognition, a manual inspection is provided, citing paragraphs [0078] and [0079].

However, Chen simply suggest that marginal words that do not provide too much useful information as a keyword are provided for manual inspection before grouping. Chen does not teach or suggest that if the caller identified based on a recognized speech unit sequence (step “h” of claim 10) is different than the caller identified based on a plurality of acoustic scores (step “c” of claim 1) then a user prompt should be generated as recited in claim 11. Similar differences exist with respect to claims 23, 32 and 37.

Therefore, even if the references were combined as suggested in the Office Action, the resulting combination would still fail to teach or suggest the invention recited in claims 11, 23, 32 and 37.

Applicant therefore respectfully requests that the rejection of these claims under §103(a) based on Almeida in view of Chen be withdrawn.

**D. Claims 12, 24, 33 and 38**

Claims 12, 24, 33 and 38 were rejected under §103(a) as being unpatentable over Almeida, in view of Beigi et al.

The Office Action alleges that Almeida fails to teach merging voice patterns using a distance measurement, but suggests Beigi et al. discloses a speaker recognition system in which speech models with closest distance are merged, citing column 4, lines 1-12.

However, Beigi et al. do not teach or suggest such a merging process within the context of a system of method of identifying a caller recited in the respective independent claims from which claims 12, 24, 33 and 38 depend. Even if the references were combined as suggested in the Office Action, the resulting combination would still fail to teach or suggest the invention recited in claims 12, 24, 33 and 38.

**E. Claims 13, 25 and 34**

Claims 13, 25 and 34 were rejected under §103(a) as being unpatentable over Almeida, in view of Beigi and further in view of Chen.

These claims add a step of generating a user prompt, which identifies certain acoustic models when flagging the certain acoustic models for merging together. As discussed above, Chen and Beigi et al. still fail to teach or suggest the overall invention recited in the respective independent claims, even if combined with Almeida. Therefore, Applicant respectfully requests that the rejection of these claims also be withdrawn.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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